

OBSERVATIONS

ON

CLEFT PALATE, AND ON STAPHYLOGRAPHY.

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Author's experience increased since the reading of his paper on these subjects in 1844, before the Medical and Chirurgical Society of London; nature of cleft palate; different forms and kinds of; its complication with harelip; effects of malformation on deglutition, and on voice and speech; method of obviating defects before modern operation of staphyloraphy; advantages and disadvantages of latter proceeding; indifferent success of the operation, although performed by most of the leading surgeons in Europe and America; success of Roux, Mütter, and Dr. J. M. Warren; apathy of British surgeons on the subject; author's investigations; anatomy and physiology of cleft palate first described by him; new operation proposed and performed by author, and its success in various instances; reviews of different proposals, by Roux, Bushe, Dieffenbach, Pancoast, Liston, Mittauer, and J. M. Warren; fit cases for operation; age proper for its performance; author's operation described; ligatures and knots; new knot; after-treatment; causes of failure of operation; examples of success of author's plan; effects of operation on voice and speech, &c.

Two years have now elapsed since I delivered a special lecture on these subjects, and about the same time I communicated a paper to the Royal Medical and Chirurgical Society, which was afterwards honoured with a place in the volume of "Transactions" for the year 1845. During the interval my experience has accumulated, and I am now desirous of stating the results, while, at the same time, I bring before my pupils as much upon such topics as pertains to the duties of the chair which I occupy in this college.

The state of the mouth, familiarly known under the name of cleft palate, is congenital, although a condition somewhat analogous to it occasionally results from injury or disease. It is chiefly to the natural malformation that the following observations apply, although they are suitable in many respects to other imperfections in the palate and roof of the mouth generally. The congenital defect is met with in a variety of forms: in some instances the fissure is limited to the uvula, when that part appears double; in others the fissure extends further forward, so as to leave the velum in two halves; the whole, or a portion only of this part, may be thus; the fissure may extend partially or entirely through the hard palate; the alveolar ridge may also be implicated, in which case the condition is usually, if not always, accompanied with

fissure in the upper lip as well. The harelip and cleft palate very frequently go together, although it is by no means unusual to see either the one or the other by itself. The fissure in the uvula and soft palate is invariably in the mesial line; even in the hard palate it appears to be so, although commonly the vomer is attached below, directly in the middle, and the fissure communicates with one nostril only. When the alveoli are divided also, the fissure is always to the side, and this is particularly conspicuous when there is a double harelip present at the same time. There are, then, intermaxillary bones immediately underneath the columna, on which rests the middle portion of the upper lip. Sometimes the fissure appears as a narrow slit, and in other instances is so wide and large as to cause the mouth and nostril to appear like one huge cavity.

The effects of cleft palate are observable in various ways. In infancy, if the malformation be at all extensive, there may be imperfect nourishment, in consequence of part of the food passing into the nostrils during deglutition; and in advanced years the peculiar tone of voice and defective pronunciation are remarkably characteristic of this condition. Infants sometimes die from inanition in this state; and in the adult the deficiencies alluded to are often such as to mar his prospects in life. The tone of the voice often gives rise to unjust suspicions against the sufferer, and there are many so conscious of the unpleasant sound that they use it as little as possible.

Until the present century, the means known for obviating the defects alluded to were of a very imperfect kind. In the adult, the opening could be closed only by an obturator or false palate; and in the child, even now, we know of no other remedy for the defect than a spoon or bottle, with some contrivance attached to it whereby the food is passed almost into the pharynx at once. In modern times, however, something more has been done for the adult; and it has been proposed to treat the fissure in the palate on the same principles as have long guided us in cases of harelip. Roux and Graefe in Europe, and Warren in America, pared the edges of the cleft, and brought them into contact in such a manner as to permit union by the first intention; and so the malformation was soon remedied, as in the more familiar example of harelip.

The intention with which an obturator or false palate is applied is, that, by closing the direct communication between the mouth and nostrils, the sound of the voice may pass outwards through the mouth, without the nasal accompaniment which gives its unpleasant character. It is also used to prevent the escape of food upwards: for although the adult, by long custom and constant care, can generally swallow all his food and drink, yet, in an unguarded moment, a lapse may occur, and cause much annoyance. The objects of the operation being the same as those just alluded to, it will be very apparent that, if the two sides of the palate can be brought together to have the same effects as the obturator, the advantages are great in favour of such a proceeding. If the operation be successful, the parts are put in a condition similar, in most respects, to their natural state, as if no such malformation had ever been present. As regards the voice and articulation, this was remarkably evinced in the case of the first patient on whom Roux operated. When the gentleman, a student of medicine, returned among his former



friends, there was such a change for the better, that he could not have been recognised by his speech alone.

Notwithstanding the apparent merits of the surgical operation for cleft palate (staphyloraphy, as it is called), there are certain disadvantages connected with it, which should always be borne in mind when an opinion is required on the propriety of performing an operation, or the probability of its results. Even with the utmost care the proceeding when done may end in partial or complete failure. There may be some portion of the fissure, perhaps in the hard palate, which may baffle the surgeon's skill; or, from causes over which he has no control, the union of the soft parts, which it is his object to effect, may not occur. Even under the most favourable circumstances, as regards union, the patient's speech may not be so much improved as had been anticipated. Then there are difficulties connected with the operation so vexatious, so trying to the surgeon's patience, as well as to the endurance of the patient himself, that it must always be looked upon as one of the most harassing that we are ever called upon to perform. The slightest opposition on the part of the patient may prevent the operation being performed; and a trifling indiscretion, in not attending to the injunctions of the surgeon afterwards, may mar the effect of the proceeding, however successfully it may have been accomplished at the time. All these circumstances, as observed in different cases, have, no doubt, had effect on the surgeon's mind, and, as the successful results have not been commensurate with the seeming disadvantages, have rendered him somewhat careless regarding the proceeding.

The operation has, nevertheless, been done by most of the leading surgeons of the day, among whom may be mentioned Roux, Graefe, the Warrens (father and son), Dieffenbach, Brodie, Guthrie, Liston, Bushe, Cusack, Crampton, Mittauer (of Virginia), Mütter, and Pancoast (of Philadelphia), &c. In 1842, it was said that Roux had performed it upwards of one hundred times. In two-thirds of the simple cases, and in one-third of those which were complicated, the proceeding had been beneficial. In 1843, my friend Dr. Mütter had operated twenty-one times upon the soft and hard palate, and out of this number "had failed to relieve the patient but in two cases;" and Dr. J. Mason Warren had been equally successful in thirteen out of fourteen instances, in which he had operated. Indeed the success of these gentlemen had seemingly been greater than that of the distinguished author of the operation—Roux, although it may be observed that the cases were far fewer in number than had been treated by that surgeon. Few though they are, however, comparatively I do not suppose that any surgeon in this country has operated on so many; no statistics have been drawn; no one has had the courage to publish an account of his cases; and a general impression has prevailed that the proceeding has been very unsatisfactory. Among the various cases that had come under my own notice, until within a comparatively recent date, the constant failures had been such as to induce great apathy on my part towards the proceeding—an apathy which had been somewhat increased by the failure of an operation performed on a gentleman in London, by Roux himself, when here on a visit a few years ago; and also by a similar result following an operation done by Mr. Bowman, in whose hands the pro-

ceeding had received every justice. I mention the latter case thus pointedly, because I shall have to draw attention to it again in a future part of this lecture.

I had not, however, given up all interest in cases of this malformation, and certain circumstances induced me, about three years ago, to bestow more attention and study on the subject than I had done previously. A preparation of cleft palate in my possession gave me an opportunity of investigating the anatomy, and this led me to draw certain conclusions regarding the physiology and surgery of these parts, such as, I believe, had never been made before.

It had long been familiar to those accustomed to see such cases on the living body, that during deglutition the two portions of the uvula came together in the middle line; but no one had attempted to explain how this could happen; and even such an acute observer as M. Malgaigne* stated, that it was "by a muscular action, of which it is difficult to give an explanation." The dissection of the parts enabled me to explain this in a way which I imagine is incontrovertible; and to show you how this happened, as well as for other purposes, it will now be best that I should explain to you the condition of the parts in this malformation, and contrast it in as far as may be requisite with the natural state.

The preparation now before you exhibits the upper part of the mouth and pharynx of an aged female subject. The muscles of the pharynx have been carefully dissected, as have also those connected specially with the palate. A glance at the roof of the mouth shows the gap in the mesial line, and how the uvula, soft palate, and a portion of the hard, are involved in the defect. Behind it may be observed that the constrictors are not so broad,—so capacious, as in the natural condition, but that the muscular fibres are nevertheless as strongly developed. The upper border of the superior constrictor is especially well marked; and here it may be seen to form a kind of semicircular margin, extending between the basilar process of the occipital bone and the internal pterygoid plate, on which margin the levator palati muscle seems to rest. A perpendicular incision has been made through the pharynx behind, exactly in the mesial line, and, the mucous membrane having been stripped off the inside, the muscularity is thus rendered still more distinct. The mucous covering has also been taken off the upper surface of the palate, whereby one side of the nostril immediately above, and the muscles of the palate, have been more extensively exposed.

It may now be seen how the two portions of the uvula and corresponding parts of the soft palate touch each other during deglutition, for it is evident that, as the superior constrictor muscles act, they must throw or push the soft tissues in front forwards and inwards;—an effect which will be aided by the superior fibres of the middle constrictors, which, stretching across as they do from one side to the other, having no attachment mesially, as is also the case with the lower fibres of the superior muscles, must contribute powerfully to the result in question. A remarkable difference may here be observed between this and the normal state of the parts: the palato-pharyngei muscles are not attached

* "Manuel de Médecine Opératoire." Paris. 1834; p. 486.

to each other, as in the well-formed palate. These muscles are seen to form the principal part of the free margin of the palate along the line of fissure; their course is somewhat semicircular from their upper end to their lower, the convexity being towards the middle; and it follows that during action, if not opposed in any way, they must pull the parts outwards—an action the reverse of that described by Dzondi, Müller, and others, as belonging to the muscles in their natural condition. The levator palati is seen throughout its entire course, and the tensor palati may also be clearly made out. The levator, it will be perceived, as I imitate its action by pulling it, not only acts very efficiently on the moveable portion of the palate, but its sphere of action, from the muscle being chiefly muscular throughout its entire course, is so great that, during rigid contraction, it must forcibly pull the soft parts upwards, backwards, and outwards. It is worthy of special observation, that the tensor or circumflexus palati has hardly any influence on the velum, for, pull as I choose upon it, there is only the slightest movement to be observed at the parts where its tendon spreads on the surface of the soft palate. Neither in the natural nor in the cleft palate can this muscle have a power at all to compare with the levator, which, from its length, position, and character generally, is the principal motor of this very mobile part. The anterior pillar of the fauces is very slight, and the fibres of the palato-glossus are indistinct; the posterior pillar, however, is distinct enough, and formed as in the natural state by the bundle of fibres of the palato-pharyngeus. The azygos uvulæ is by no means distinct; a bundle of fibres, about the size of a crowquill, may be seen on the lower part of each free margin of the soft palate.

From such an inspection as this preparation afforded, I was led to take those views of the physiology and surgery of the parts, the explanation of which forms the principal object of this lecture. It required no great foresight to perceive that the movement of each side of the palate must depend chiefly upon the action of the levator muscle and palato-pharyngeus. The influence of the levator muscle might have been calculated on from previous knowledge, but that of the palato-pharyngeus could scarcely have been thought of. Both must evidently have the effect of widening the fissure, especially the levator; and the various conditions under which the palate may be seen can be explained by reference to these two muscles. When the mouth is looked into, and the soft portions of the palate are in a quiescent state, the fissure will then appear probably in a medium state. A slight irritation, with a probe or point of the finger, will cause a corresponding movement—the soft parts will be drawn upwards and outwards, so that the gap will be enlarged. If the irritation be increased, the same parts will be so acted on that they will almost disappear on the sides of the fissure; but even now, if an effort at deglutition be made, the two portions of the uvula will be forced together, by the action of the superior constrictors, as already explained. It seemed to me that under ordinary circumstances, after the operation for closing the fissure, the slightest irritation would be likely to call the levatores and palato-pharyngei into action, and so induce that dragging on the stitches with which surgeons were so familiar—an influence sufficient, in some instances, to cause ulceration in the seat of the threads, or, in others, to cause separation of the recently-

united parts. I therefore supposed that, if these muscles could be divided before bringing the edges of the palate together, the parts would remain so quiet immediately afterwards that there would be greater probability of union in the mesial line taking place than if the muscles were left entire or untouched. It was not long before I had an opportunity of testing the project on the living body. The result was so satisfactory that I tried it in another instance shortly afterwards, and here the effect was most complete. The two cases were appended to my paper on this subject when laid before the Royal Medico-Chirurgical Society,* and since that date I have operated on eight more, making ten in all, in eight of which I have been perfectly successful in closing the soft palate. In some of these there has been fissure of the hard palate as well, and the parties have been content with the remaining comparatively small apertures, or have had them closed by obturators. I know of four other instances where the operation, conducted on the plan recommended by me, has been successful, and a fifth which failed. During the same period I have known three examples of failure by the ordinary method. Thus, out of fifteen cases on my plan, there have been three which did not succeed, while all those done in accordance with Roux's operation were failures.

Surgeons have long been familiar with the difficulty of keeping the parts quiet during, but especially after, an operation, and many ingenious proposals have been made to obviate this. The most simple and, perhaps, most reasonable was the plan of after-treatment pursued by Roux. The patient was enjoined to silence, and to abstain from any effort at deglutition; he was not permitted to swallow his saliva even. But this did not appear sufficient in all cases, and the distinguished author of the operation proposed to separate the soft palate from the hard by a transverse incision, and the plan was afterwards recommended by Mr. Bushe, of New York.† This method was advised in examples where the gap was large and involved the hard palate, and it would certainly permit the anterior parts of the soft palate to be more readily brought into contact. Dieffenbach and Pancoast‡ have split the flaps in the way represented in the diagram (fig. 1). The latter gentleman has described the process thus:—"When the knots were prepared for tying, but before they were finally secured, Wenzel's cataract-knife was passed from before backwards, through the attached side of the palate, to enable the two halves of the velum to come together in the middle line, as well as to divide the insertion of the palate muscles, so as to prevent them straining the outward edges of the palate asunder." Mr. Liston§ has advised that, "before the ligatures are finally secured, the parts being put on the stretch, an incision should be made on each side towards the alveolar ridge, through the anterior surface of the velum, by which method the edges come together more easily, and the strain is taken off the threads, so that there is less risk of them making their way out by ulceration." The accompanying diagram (fig. 2) is a copy of that given by Mr. Liston himself.

* Transactions, 1845.

† "An Essay on the Operations for Cleft Palate," by G. Bushe. New York, 1836.

‡ "American Journal of Medical Science," vol. xxxii. p. 71.

§ "Operative Surgery."

Fig. 1.

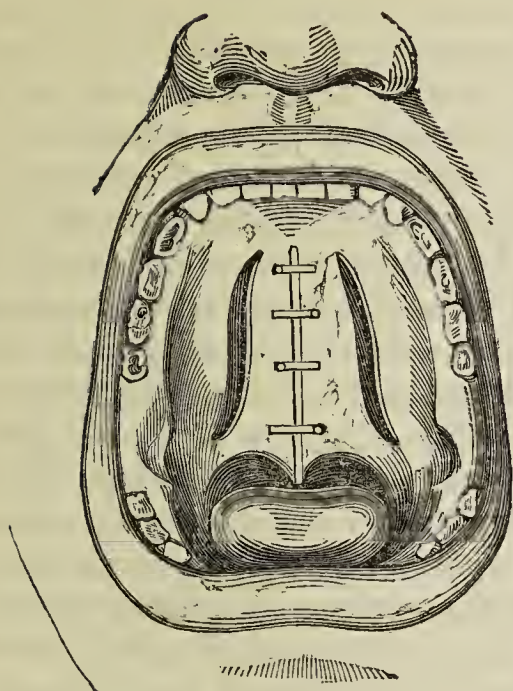
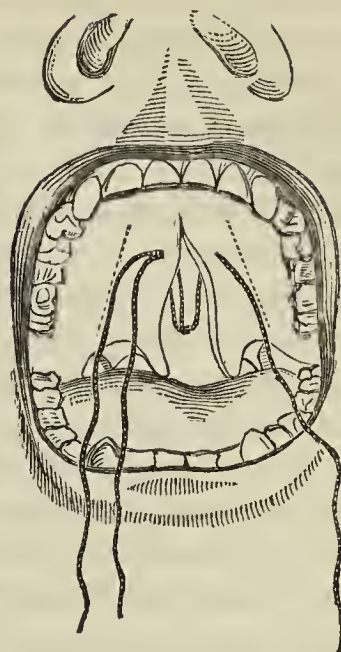
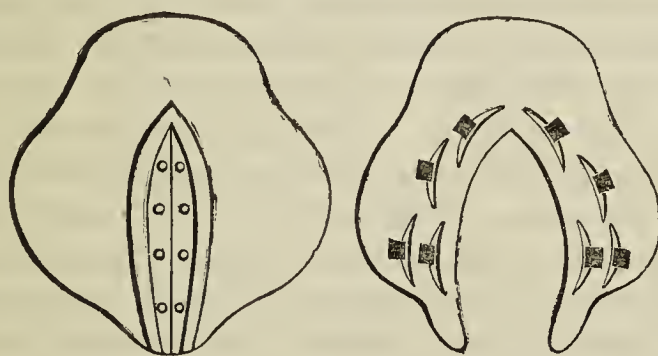


Fig. 2.



Dr. Mittauer, of Virginia,* has proposed to increase the breadth of the two flaps, by making various incisions in the palate. One plan is, to make a series of lunated wounds through the flaps, each about half an inch in length, along the margins of the fissure, which are permitted to heal by granulation, and thereafter the ordinary operation is performed. Another plan of Dr. Mittauer's is, to make a long incision on the lower surface of the palate on each side of the fissure, at the time of doing the operation. Both of these methods may be understood from this diagram (fig. 3).

Fig. 3.



Dr. J. M. Warren has stated† that he had found the following course to be invariably followed by success:—"The soft parts being forcibly stretched, a pair of long powerful French scissors, curved on the flat side, are carried behind the anterior pillar of the palate; its attachments to the tonsil and to the posterior pillar are now to be carefully cut away, on which the anterior soft parts will at once be found to expand, and an ample flap be provided for all desirable purposes."

From the variety of plans here alluded to, it will be observed, that the difficulty of bringing the edges of the gap together, of preventing dragging on the stitches, or subsequent separation of the newly-united parts, had not been overlooked. It is singular enough, however, that

* "American Journal of Medical Science," vol. xxi. p. 309.

† "New England Quarterly Journal of Medicine and Surgery," April, 1843.

none of them have had reference to the correct anatomy of the parts ; indeed, scarcely an allusion has been made to this subject. Dr. Pancoast is perhaps the only party who has alluded in apparently precise terms to the muscles of the parts, for his incisions are intended, to use his own language, “to divide the insertion of the palate muscles.” It so happens, however, that no palate muscle is inserted exactly in this direction. The line marked out (fig. 1) runs parallel with the fibres of the palato-pharygeus ; and were the levator palati divided in the incision, it would only be by chance ; indeed, it would be next to impossible to divide it in such a way ; the knife would, in all probability, pass through the palate either on the inside or outside of the lower end of the muscle. In the quotation already given from Mr. Liston’s work, no allusion is made to the anatomy of the parts, and it does not appear that more was intended than to permit that relaxation which a gap on each side might be supposed to produce as regards approximation in the mesial line. In the last edition of the excellent volume alluded to, which has come out since the appearance of my paper on cleft palate, and after the author inspected my dissection, it is advised that the incision “through the anterior surface of the velum” should be made “well down by the sides of the uvula” (fig. 2.) It is stated, too, after allusion is made to my proposal, that “if the fleshy belly of the circumflexus palati could safely be reached and cut, this would, so far as I can understand, put the parts in a still more favourable condition to come together. Its tendon is certainly divided by the incision above directed, properly and effectually carried out.” Doubtless it had escaped Mr. Liston’s memory that my preparation proves that the circumflexus muscle has scarcely any influence on the palate—a circumstance which I have alluded to in my paper. The “fleshy belly” of this muscle may be reached with nearly as much safety and facility as that of the levator, but it seemed to me that so little good would result from its division, that I was content with the statement as to its comparatively unimportant action. An incision “through the anterior surface of the velum” would not include any portion of the circumflexus, and one “well down by the sides of the uvula” could not possibly reach the tendon of that muscle. Mr. Liston* justly observes, that “the union is apt to fail under any circumstances ;” and, moreover, adds, in reference to my own views, “and I think that this was found to take place in the hands of the above-named professor, even after the division of the muscles, as he has recommended,”—a thought the accuracy of which I cannot impugn, although the reflections on this subject do not seem to me to have been either so extensive, or founded on such accurate data as one might have expected, in an authority so unquestionable and so impartial : for it does not appear that Mr. Liston had remembered the two successful cases which were detailed in my paper presented to the Medico-Chirurgical Society, nor the statement† which I had subsequently placed in his hands, that I had been successful with the practice in six instances out of eight wherein I had performed the operation in the manner alluded to.

* “Operative Surgery,” 4th edit., p. 572.

† “System of Practical Surgery,” 2nd edit., p. 532.

In Mittauer's plans (fig. 3) no allusion is made to the anatomy of the parts; some of the little wounds through the palate must implicate a few fibres of the palato-pharyngeus, but the long incision on the lower surface of the palate cannot touch any muscular fibres. In Dr. J. M. Warren's incision with the scissors, a portion of the palato-pharyngeus might possibly have been divided; but this plan, like all the others above alluded to, while intended to produce mechanical relaxation, had no special reference to the anatomy or physiology of the parts.

There are cases of cleft palate with which it would be unreasonable to meddle: the gap being so large, and the soft tissues so narrow, that union could not possibly be anticipated. It has been supposed that when the two portions of the uvula are observed to touch each other during deglutition, the operation may invariably be undertaken; but the fact is, that in almost all instances these two parts touch at this particular time, however large the fissure may be, and it is better to be guided in deciding upon the propriety of an operation by the condition of the parts otherwise. In most cases where the osseous palate is open, there will be less certainty of a favourable result than if the soft velum alone were implicated. If it seems that only a small portion of the fissure in the soft parts can be closed, it will perhaps be best to leave the parts alone, and to trust for improvement entirely to an obturator or false palate, for it has sometimes been found that when there has been union only to a small extent, the condition has interfered with the proper adaptation of the apparatus.

The operation should seldom be undertaken until the patient has reached puberty. Much steadiness and self-command is required on his part, both during the operation and afterwards; and it is hardly to be expected that one under this age will have the fortitude to do what the surgeon expects of him. I have, in one instance, seen a youth of eleven years of age comport himself admirably during the operation; but any time between sixteen and four-and-twenty, is that which should be preferred.

The mode of proceeding which I generally follow may be thus described:—The patient should be seated on a firm chair, with his face to the light; the surgeon should stand a little in front, on the right side, and occasionally behind the patient. In this latter position he may see into the mouth by leaning over the face, and use his fingers with more satisfaction and facility than if he were always in front, for here he is apt to obstruct the light, and possibly fatigue his hands by holding them so long in an elevated position towards the roof of the mouth. With a knife such as that which I here show you (fig. 4), I make an incision, about half an inch in length, a little above the free margin on each side of the cleft, whereby the levator palati muscle is divided. The knife is sharp at the point, and also at each side, so that it may be readily passed through the mucous membrane, and carried backward and forwards to enlarge the wound to the requisite extent. The point of the blade is entered above the middle part of each soft flap, where there is the greatest thickness of tissues, and, whilst it is carried deep against the levator muscle, it is moved as just directed, and not withdrawn until the power of elevating the part seems to be done away with. If, when the knife is withdrawn, there should still appear strong mus-

cular action in an upward direction, as may be ascertained by irritating the parts, it may be used again, as possibly the whole of the muscle may not have been cut across. All this can be best done while standing at the patient's side. The edges of the fissure should now be pared; the mucous membrane on the middle part of each margin should be seized with hookbeaked forceps (fig. 5), and transfixed with a narrow, sharp-pointed blade (fig. 6), which should then be run backwards and forwards so as to remove a slip of the membrane throughout the whole

Fig. 4.



Fig. 5.

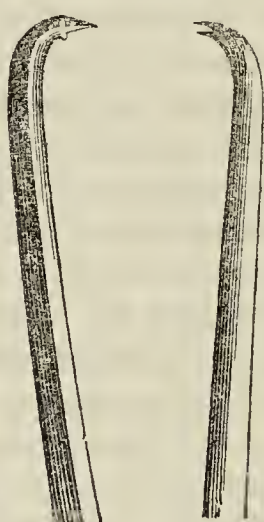
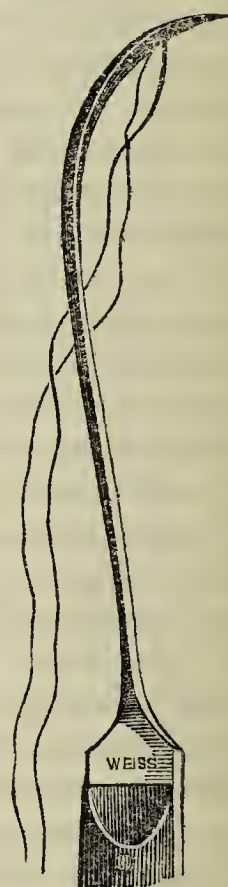


Fig. 6.



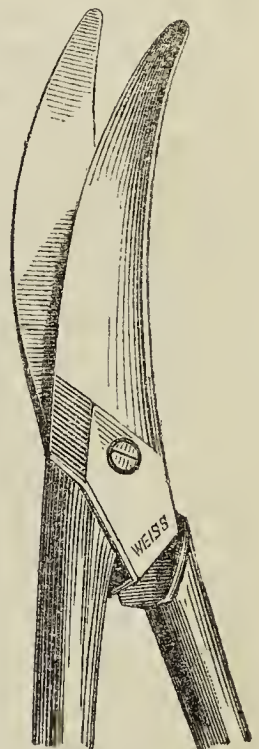
Fig. 7.



line of the gap. I have found it most convenient at this stage of the proceeding to stand before the patient whilst paring the left side, and behind him while cutting on the right side; but if the surgeon can hold the different instruments in each hand with equal facility, he may stand as he chooses. During the time, and more especially after, these incisions are made, small pieces of sponge wrung out of iced water should be applied to clean the parts from blood and mucus; and the patient may also gargle the throat with cold water. The stitches should next be introduced thus:—A needle, such as is here shown (fig. 7), set in a handle, armed with a portion of stout silk thread, three-quarters of a yard long, should be passed through the soft flap about a quarter of an inch from the free margin, half an inch or less from the posterior edge of the osseous palate, from below upwards, and when the eye appears above or in the gap, the thread should be seized and drawn into the mouth with forceps; while the needle is withdrawn, the end of the ligature (as yet double) should be brought out from the mouth to facilitate future steps, and also to prevent slipping. The same needle, or another

like it, armed with a thread of a similar length but much thinner, should be passed in like manner through the other side of the cleft palate, exactly opposite the first puncture, and similar manœuvres should be repeated. By fixing this second thread to the bent end of the first, where it is hanging out of the mouth, and then withdrawing it in the course through which it has already passed, the thread intended to form the stitch will thus be brought through the opposite side of the palate, when one end of it (for it has as yet been double) can be drawn out so as to leave both ready for knotting. Two, three, or four more threads, as may seem requisite, can be introduced in a similar manner; and now all that remains to be done is to draw the edges together and fasten the threads. The foremost thread should be first tied in accordance with the ordinary mode of making the interrupted suture; and the others should then be treated in the same order in which they have been introduced. Should an additional suture seem requisite in any part of the fissure, it may now be introduced by pushing the same needle from one side to the other—for now, when the parts are more fixed by the sutures, this may readily be accomplished. Before fastening the two knots furthest back, the pared edges should be brought together to ascertain the influence of the palato-pharyngeus in dragging them asunder. If this action seems strong, or if there be difficulty in drawing the parts together, the threads should be pulled forwards, whereby the posterior pillars of the fauces will be put upon the stretch, when each should be cut about half an inch behind the uvula, in an outward direction, to the extent of a quarter of an inch, and then there will be greater relaxation. Long curved scissors, with blunt points, like these (fig. 8), are such as I use for this part of the proceedings, and the same are good for cutting off the ends of the ligatures, which is the last step in the operation.

Fig. 8.



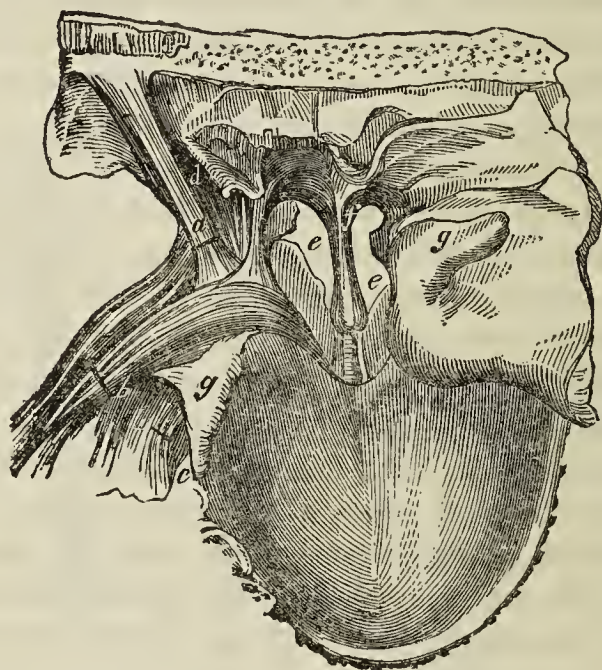
In some instances it may appear best to effect the division of the palato-pharyngeus before passing the stitches. If this be desired, the fibres can be put on the stretch by drawing the uvula forwards with the beaked forceps. It will rarely seem requisite to meddle with the palato-glossus, but if its division is thought advisable, the scissors just referred to will be the best instrument to use. A small horizontal wound in front of the tonsil, and about midway between the tongue and palate, as represented in fig. 9 (c), will suffice.

The hookbeaked forceps, and also those for seizing the threads, should be a little longer than those in common use; and the curved needle is similar to that often employed for the strangulation of hemorrhoids, nævi, and such like growths.

This figure (fig. 9) will probably, in some degree, elucidate the above description. It gives a view of the posterior nares, with a cleft implicating the whole of the soft palate, and a small portion of the hard. On the left side the mucous membrane has been dissected from the muscles. *a.* The levator palati, on which is marked the line where it should be cut across. *b.* The inner bundle of fibres of the palato-

pharyngeus, which forms the posterior pillar of the fauces, with the black line indicating where the scissors should be applied. *c*. The palato-glossus, with the mark for division, if that should seem necessary. The tonsil lies between these two muscles. *ee*. The posterior extremity of the inferior turbinated bone. *f*. The septum. *gg*. The uvula on each side stretched apart.

Fig. 9.



I have named a stout silk ligature, as I think it preferable to any other kind. Sometimes I have used a hempen thread, but it is difficult to get the material sufficiently small and strong at the same time. I have never used the lead ligature, as recommended by Dieffenbach and others, and, from my experience of the operation, should not feel inclined to try it. The threads to be used should be well rubbed with wax, and it is highly advantageous to have them of different colours, whereby they can be more readily recognised during the proceedings.

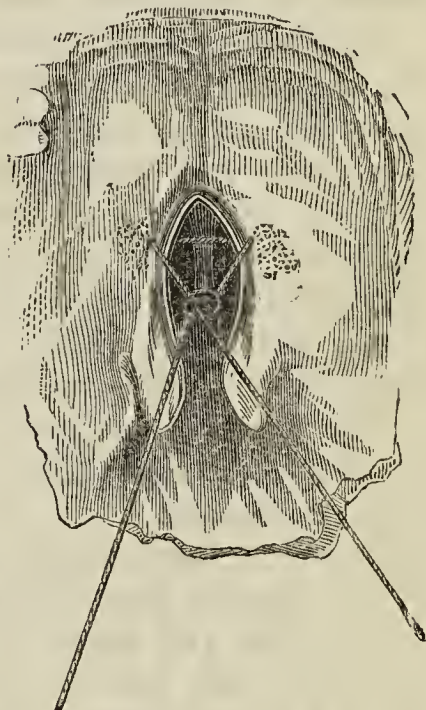
In the ordinary operation, it has been found, on attempting to cast the common knot for the interrupted suture, that the first turn of the thread is apt to slip ere the second can be drawn. To prevent this, the points of the common forceps have been closed upon the first until the other has been brought upon it; or the surgeon's knot has been used* in expectation that, the first twist of it being double, there should be less risk of slipping. Instead of a knot, Sir Philip Crampton† has passed the two ends of the thread through an aperture in a bead of soft metal, which he has squeezed closed upon them at the proper distance. Mr. Brooke has, with an ingenious method, by means of glass beads, proposed to improve the style of suture here. The common knot and the surgeon's I have used most frequently, for I have always supposed that the beads might increase the after-irritation. Besides, I feel satisfied that, in the operation which I perform, there is far less dragging on the threads than under ordinary circumstances, and that there is consequently less tendency to slip. But the slightest elasticity in the lateral flaps, unless indeed they be very broad, will be apt to produce

* Professor Smith and Dr. J. Mason Warren.

† "Dublin Journal of Medical Science," July 1, 1843.

a slip; and, to obviate this, I imagine that a knot of this kind will be found very serviceable. On one portion of the thread I cast a loose loop, with a single turn; the other end being then passed through it, the loop is drawn tight, and the fingers are then pushed towards the roof of the mouth and margins of the fissure, as with an ordinary knot. If the loop is drawn tight, there is no risk of slipping; it should hold, in fact, as if a metal bead were squeezed somewhat tightly upon the end within it. When sufficient tightness is secured, as regards the wound, a knot should be cast on the two ends of the thread, as in the common mode of fastening an interrupted suture. This diagram (fig. 10) will best explain the verbal description just given. Professor Pancoast has advised that the knots should not be left in the mesial line, where they would be exactly over the wound, but that they should rather be kept to the side, as represented in one of the preceding diagrams (fig. 1). It will be found easier to do this with the knot I have just recommended than with the common one, or more especially the surgeon's; and, as I believe it is rather an advantage to keep them off the wound (for the ends are apt to lodge in it, thereby preventing union to a certain extent, and causing irritation on the raw surfaces), I advise you to think of this plan, which seems to me to embody the advantages of the beads, while the knots will, from their size, be less annoying to the patient than the materials alluded to.

Fig. 10.



When the operation for cleft palate is performed in the ordinary manner, there is generally so much muscular spasm as to cause great difficulty in paring the edges and introducing the needles, as well as bringing and holding the cut edges together. By the plans recommended by me, these difficulties are entirely done away with, or greatly modified. The first incision is intended to take off the influence of the levator palati: if it be successful, the palate seems to drop a little, and it is not so forcibly dragged upwards and outwards as under ordinary circumstances. Some movement of this kind may possibly still be present, and it may depend upon some of the fibres of the muscle having escaped the knife. The palato-pharyngeus, being still entire, will draw the margins of the fissure outwards; but when this muscle is divided, there will then be no longer any action of the kind. This muscle, however, has so little influence compared with the levator, that it seems to me advisable not to divide it on all occasions until the probable amount of dragging upon the stitches has been ascertained. Even when its fibres are cut, there will be some convulsive movement in the lateral flaps, for the part between the section and the attachment in front will be in some degree under the influence of muscular contraction; a shortening may take place when the parts are irritated, and this movement will be aided by the azygos uvulæ, which throughout the whole proceedings remains untouched, unless when paring the edges or passing the stitches.

Whatever irritability there may be,—however great the spasm, there will certainly be less difficulty in passing the needles, and less opposition to the closure of the fissure, than under ordinary circumstances. After the sutures are fastened, the parts are more quiescent than with the muscles entire; indeed, in the course of a few hours (if not immediately after the operation), the roof of the mouth may be touched or tickled as you choose, and there will scarcely be any movement observed. There is one advantage in the incision which I make on the upper surface of the flaps, which is probably not the least that I claim for my own mode of operating. The wound is in the course of a few hours filled with lymph, which so thickens and stiffens the palate, that any twitching of muscular fibres that may have been observable before, are no longer apparent.

However efficiently the incisions which I recommend may be executed, the operation may, nevertheless, fail. The ordinary operation for hare-lip, when performed even under the most favourable circumstances, will sometimes fail, and occasionally a simple incised wound in the skin will not unite. Such results are still more likely to happen in the operation for cleft palate. The causes of failure may be as obscure as they often are in other wounds, but sometimes we may see reason why it has not taken place, and it may be well to refer to some of the circumstances likely to lead to an unfavourable issue.

The grand immediate object of the operation is to obtain union by the first intention, and this may be thwarted in various ways by the surgeon himself.

Hitherto, the principal cause of failure has probably been the dragging on the stitches from the action of the muscles, and the consequent disposition for the parts to be drawn asunder; and this cause, I would fain hope, may now be in a great measure obviated by the proceedings which I recommend. There may be a deficiency of adhesive action, or there may be an excess of inflammation. In one case the gap may fly open almost as soon as the stitches are removed; in another the process of ulceration may produce the like effect after the lapse of days. Sloughing may actually occur, and there may be defects in the performance of the operation to account for this as well as otherwise to cause failure. I believe that extensive incisions, whether on the plans recommended by Roux, Dieffenbach, Mittauer, Liston, Warren, or myself, may possibly induce defective circulation or excess of inflammation, and from either of these conditions sloughing is likely to happen. The stitches may be so numerous as to do harm, especially if drawn so tight as to impede circulation, or possibly there may be so few that the surfaces are not properly held together. The needles may be introduced too far from the margins, or not far enough, or perhaps the margins themselves may not be sufficiently pared. I imagine, too, that evil may arise from awkwardness in effecting the whole proceedings: for, if there be much manipulation, much squeezing, pinching, or poking with knives, needles, and fingers, the chances of adhesion are thereby diminished.

After the operation is finished, every care must be taken that nothing be allowed to interfere with the process of union. It is very certain that, if the patient were permitted to use the parts in the ordinary way, such as in eating, drinking, or even swallowing the saliva, they would

be greatly disturbed, and adhesion might not occur. If all the muscles of the palate be left entire, as is the case in Roux's operation, the least effort at deglutition will cause considerable spasm and dragging on the stitches, and in examples where the gap is large, it is easy to perceive that much harm might result on such an occasion. Even in the proceeding which I follow, perfect quietude cannot be obtained, for the tongue below, and the constrictors behind and above, will still, during the act of swallowing, have such influence upon the palate, as greatly to disturb the healing action. It is requisite, then, to restrain the patient from such evil chances until adhesion has become so firm that it cannot be readily severed. Roux used to prohibit the use of food for eight-and-forty hours or more, and to prevent the party swallowing even his saliva. But danger may arise from too strict an adherence to this practice: patients have been known to take food at all risks, and so break up the adhesions; others have become temporarily deranged; and the sudden deprivation from food has caused considerable shock to the system in many instances. Sir Philip Crampton* has not acted rigidly upon this rule, and has permitted some of his patients "boiled bread and milk, custards, soups, and jelly, twice or three times a day." In most of my cases I have given the patient gruel, soup, and wine, frequently during the day, and have invariably noticed that those thus treated have recovered more rapidly than the others who have been refused all food and drink. The custom of permitting a hearty meal one hour before the operation should not be neglected; but there is great chance of its being ejected from the stomach during the proceedings, for there are few patients who do not get squeamish during the dealings with the palate. Indeed, I have remarked the chances to be greater in those who have partaken most largely of food beforehand.

A tickling cough almost invariably comes on a few hours after the operation, especially if the uvula swells much, as it often does—so that it actually drops on the root of the tongue and epiglottis, and I have found a draught containing sixty minims of the compound tincture of camphor, at bedtime, to be of great service in such cases. The bowels are usually constipated for the first two or three days, and I generally add a drop of croton oil to such a draught, with good effect. The patient may keep in bed, or sit up during the day, as he may incline; and, as a matter of course, when he is swallowing what you permit, he ought to do so with caution. On the second or third day after the operation, one, two, or more of the stitches should be removed; on the third or fourth day, if they have not already all been taken away, this should be done; they are more likely to do harm than good, if permitted to remain beyond this time. But the surgeon must use his discretion on this point, as indeed is necessary as regards all the after-treatment, for I do not think it reasonable to give out rules which shall answer all cases. The mucus which accumulates about the roof of the mouth, particularly in those cases where there is an aperture left in the hard palate, must be taken carefully away, once or twice a day, with forceps, and it answers well to dry the parts with a bit of soft sponge, which has been previously wrung out of a weak solution of nitric acid.

* "Dublin Journal of Medical Science," July 1, 1843, vol. xxii.

In the course of eight or ten days the patient is usually so far well that he may eat and drink what he pleases, in moderation, and also take exercise in the open air. In a few days more his recovery is complete.

Among the cases to which I have alluded in this lecture, several possessed peculiar interest, in so far as regards the views which I have now endeavoured to explain. One of the unsuccessful examples, according to Roux's plan, occurred to our esteemed friend, Mr. Bowman. I saw the operation performed; it was admirably executed, and everything as regarded the favourable condition of the parts justified a sanguine hope of success. Yet in eight-and-forty hours all the stitches had given way, and the gap was as open as ever. Some years afterwards Mr. Bowman repeated the operation, with the addition of the incisions recommended by me, and a few weeks afterwards I saw the patient with a palate as entire as if it had been so from birth. One of my own cases was still more remarkable. J. T. had been operated on by Mr. Tuson, of the Middlesex Hospital, three different times, according to the method of Roux, and the opening was left in all probability larger than it was at first. There had been a small point of union about the middle of the gap, which by the traction on the flaps had been stretched out into a narrow band, not thicker than a bit of twine. Mr. Tuson was polite enough to send this patient to me: I operated, and had the satisfaction of securing union throughout the greater portion of the soft palate. When it is considered that the edges of the fissure had been three times pared before I myself touched them, it must be admitted that the parts were in a far less satisfactory condition for an operation than at first.

Besides the instance above referred to, as occurring to Mr. Bowman, Mr. Partridge has had a successful one, and so has M. Simon; in both of these, however, some secondary proceedings were requisite. One of the most successful examples of my own proceeding occurred to Mr. Storks. Union took place throughout, and in the course of a fortnight it would have been difficult to discover what had been the state of the palate before, or what had been done by the surgeon.

Even under the most favourable circumstances, a portion of the gap may not unite, or may open again in the course of a day or two, and it is then requisite to repeat part of the operation; the edges must be pared afresh, and one or more stitches passed, as may be necessary. This should not be done till after the lapse of weeks or months. An opening left after the first operation, though of such a size as to permit the air to pass readily through it for ten or twenty days, may, after some further time, so close as to cause little more annoyance.

In infancy, the principal evil from cleft palate is, that the food is apt to escape upwards into the nostrils, but as the child grows older he acquires such use of the parts that such an occurrence rarely happens. The voice now appears as the principal defect, and it is not difficult for one familiar with such cases to foretel the state of the part as soon as he hears the person speak. If there be harelip, or the cicatrix resulting from an operation for this defect, suspicion may be so much the stronger, but of course no one can say with accuracy, what is the state of the palate until it is thoroughly inspected. As the chief cause of annoyance is from the voice, the principal object of the operation is to effect a

favourable change upon it. There has, perhaps, been less said or written on this subject than it demands. The surgeon has usually been content with giving an account of the condition of the palate after an operation, but it is as interesting to know something of the voice. On this subject a variety of statements have been made in accordance with the experience derived from isolated cases. Sometimes the effect seems almost beyond belief, so great is the improvement; but in other instances there is no perceptible amendment. This latter result often arises from an aperture in the hard palate, with which the surgeon may not have meddled, and, until it is closed with some sort of obturator, the air escapes so freely through it that the benefit from closing the gap in the soft parts cannot be appreciated to its full extent. Even in such a case, however, the tone of the voice will probably have been greatly altered for the better; and if the opening alluded to be filled up, it may sound almost natural. It would yet be foolish to imagine that speech should be perfect, for how could this be with a person who had never articulated distinctly at any period of life? Some have been so sanguine as to expect this, and have been greatly disappointed. The fact is, that the party, however successful the operation may have been, has still to learn both how to modulate the voice, and to articulate. Some make great progress, and in the course of a few weeks or months the result is such as to please the most fastidious. In others the changes are more slow, for a year or more may elapse before much improvement can be noticed; and there are some who, from want of ear, of power, disposition, or perseverance, never make any satisfactory progress. In some of my own cases there has been all the improvement that could reasonably have been anticipated, but in others there has been very little. This I have attributed in some to the remaining imperfections in the palate, and in others to the want of care on the part of the patient to improve the pronunciation. I believe that all persons with this malformation have it in their power to speak more distinctly than they generally do. In one of the worst cases of cleft palate which I have ever seen, the party could articulate with considerable accuracy, and this was attributable to the care which she had bestowed in improving her voice. If, after an operation is successfully performed, the individual sets earnestly and methodically about modulating the voice and articulating distinctly, there seems nothing to prevent both being brought to a natural and average perfection. One of my patients was so zealous in his after-studies, that he soon spoke with more distinctness and accuracy than is generally observed in persons in whom the palate has been originally well formed. I have known some, however, so stupid, obstinate, or careless, that they could not, or would not, pronounce the word "yes," excepting in the old way. A person with cleft palate seldom sounds the "s" at the end of the word, because the air in expiration passes mostly through the fissure and nostrils. Even after the operation, the air is likely to pass by the nostrils, unless the person be careful to open the lips properly. If he does this, and pushes the tongue forward with its tip against the lower front teeth, the "s" will then become distinct; and if this little lesson be readily undertaken and ably performed, there may be good hopes of speedy and great future improvement.

